WHAT IS CLAIMED IS:

1. A semiconductor light emitting device comprising:

a substrate;

an n-type layer provided on the substrate and made of a nitride semiconductor material;

a multiple quantum well structure active layer including a plurality of well layers each made of $In_xGa_{(1-x-y)}Al_yN$ ($0 \le x$, $0 \le y$, $x+y<1$) and a plurality of barrier layers each made of $In_sGa_{(1-s-t)}Al_tN$ ($0 \le s$, $0 \le t$, $s+t<1$), the multiple quantum well structure active layer being provided on the n-type layer; and

a p-type layer provided on the multiple quantum well structure active layer and made of a nitride semiconductor material,

wherein the p-type layer contains hydrogen, and the hydrogen concentration of the p-type layer is greater than or equal to about 1×10^{16} atoms/cm^3 and less than or equal to about 1×10^{19} atoms/cm^3.

2. A semiconductor light emitting device according to claim 1, wherein the p-type layer contains Mg, and the Mg concentration of the p-type layer is greater than or equal to about 4×10^{19} atoms/cm^3 and less than or equal to

about 1×10^{21} atoms/cm^3.

3. A semiconductor light emitting device according to claim 1, further comprising a p-type electrode for applying a voltage via the p-type layer to the multiple quantum well structure active layer, wherein the p-type electrode contains atoms selected from the group consisting of Pd, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Tb, Ti, Zr, Hf, V, Nb and Ta.

4. A semiconductor light emitting device according to claim 2, further comprising a p-type electrode for applying a voltage via the p-type layer to the multiple quantum well structure active layer, wherein the p-type electrode contains atoms selected from the group consisting of Pd, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Tb, Ti, Zr, Hf, V, Nb and Ta.

5. A semiconductor light emitting device according to claim 1, the hydrogen concentration of the n-type layer is less than or equal to 1×10^{17} atoms/cm^3.

6. A semiconductor light emitting device according to claim 4, the hydrogen concentration of the n-type layer

is less than or equal to 1×10^{17} atoms/cm^3.

7. A semiconductor light emitting device according to claim 1, further comprising a layer including Al, wherein the p-type layer is provided, via the layer including Al, on the multiple quantum well structure active layer.

8. A semiconductor light emitting device according to claim 7, the layer including Al has a thickness of about 5 nm or more.

9. A method for producing a semiconductor light emitting device, the method comprising the steps of:

growing a nitride semiconductor material on a substrate to form an n-type layer;

forming a multiple quantum well structure active layer including a plurality of well layers each made of $In_xGa_{(1-x-y)}Al_yN$ ($0\leq x$, $0\leq y$, $x+y<1$) and a plurality of barrier layers each made of $In_sGa_{(1-s-t)}Al_tN$ ($0\leq s$, $0\leq t$, $s+t<1$), the multiple quantum well structure active layer being provided on the n-type layer; and

growing a nitride semiconductor material on the multiple quantum well structure active layer to form a p-type layer,

wherein the step of growing the p-type layer includes the step of growing a nitride semiconductor material in an atmosphere not containing hydrogen gas while keeping a temperature of the substrate at a first growth temperature.

10. A method according to claim 9, wherein the step of forming the p-type layer further includes the step of lowering the temperature of the substrate from the first growth temperature to about 400°C in the atmosphere not containing hydrogen gas after the step of growing the nitride semiconductor material in the atmosphere not containing hydrogen gas.